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मानक

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IS 3347-8-2 (1992): Dimensions for porcelain transformer bushings for use in lightly polluted atmospheres: Part 8 52 kV bushings: Section 2 Metal parts [ETD 6: Electrical Insulators and Accessories]



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भाग 8 52 कि.वा. की बुशिंग

अनुभाग 2 धातु पुर्जे

*Indian Standard*

**DIMENSIONS FOR PORCELAIN  
TRANSFORMER BUSHINGS FOR USE IN  
LIGHTLY POLLUTED ATMOSPHERES**

**PART 8 52 kV BUSHINGS**

**Section 2 Metal Parts**

UDC 621.314 - 233.2 : 006.87

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

March 1992

Price Group 4

## FOREWORD

This Indian Standard ( Part 8/Sec 2 ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

This standard ( Part 8/Sec 2 ) covers the dimensions and materials of metal parts and accessories of 52 kV class transformer bushings with the object of ensuring their interchangeability.

The dimensions of porcelain transformer bushings of other voltage ratings are covered in IS 3347 'Dimensions for porcelain transformer bushings for use in lightly polluted atmospheres' and IS 8603 'Dimensions for porcelain transformer bushings for use in heavily polluted atmospheres' for use in normal and lightly polluted atmospheres and heavily polluted atmospheres respectively.

The porcelain bushings for alternating voltage up to 1 000 V are covered in IS 7421 : 1988 'Porcelain bushings for alternating voltage up to and including 1 000 V (*first revision*)'.

This standard comprised two sections issued as two separate standards. While this section ( section 2 ) covers the dimensions of the metal parts and accessories, the porcelain parts are covered in the other section ( Section 1 ).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# DIMENSIONS FOR PORCELAIN TRANSFORMER BUSHINGS FOR USE IN LIGHTLY POLLUTED ATMOSPHERES

**PART 8 52 kV BUSHINGS****Section 2 Metal Parts****1 SCOPE**

This standard ( Part 8/Sec 2 ) lays down the dimensions, tolerances and materials of metal parts and accessories of the bushings of 52 kV 1000 A used with power transformers and reactors for use in lightly polluted atmospheres.

**2 REFERENCE STANDARDS**

A list of standards given in Annex A are necessary adjunct to this standard.

**3 MATERIALS**

The materials of various parts shall conform to the relevant Indian Standards as specified below:

*Metal Part or Accessory*

Hexagonal Nut for Stem

Stem ( *see* Fig. 1 )

Cap ( *see* Fig. 2 )

Spark Gap Horn Carrier ( *see* Fig. 3 )

Terminal Screw ( *see* Fig. 4 )

Protective Tube ( *see* Fig. 5 )

Vent Plug ( *see* Fig. 6 )

Sealing Washer for Stem  
( *see* Fig. 7 )

Sealing Washer ( *see* Fig. 8 )

Separator ( *see* Fig. 9 )

Sealing Washer ( *see* Fig. 10 )

Gasket Ring ( *see* Fig. 11 )

Upper Sparking Horn  
( *see* Fig. 12 )

Lower Sparking Horn ( *see* Fig. 13 )

**4 TOLERANCES**

**4.1** Unless specified otherwise, allowable tolerances on dimensions of any machined part shall be in accordance with medium class of IS 2102 ( Part 1 ) : 1980.

**4.2** Unless specified otherwise, allowable tolerances of dimensions of any forged or cast metal part shall be in accordance with coarse class of IS 2102 ( Part 1 ) : 1980.

**5 METAL PARTS AND ACCESSORIES****5.1 Hexagonal Nuts**

The dimensions of hexagonal nuts used shall conform to IS 1364 ( Part 3 ) : 1983. The threads

*Material*

Brass with a minimum tensile strength of 300 N/mm<sup>2</sup>

High conductivity copper to ETP grade IS 191 ( Parts 1 to 10 ) : 1980 and properties as per IS 613 : 1984

Brass Alloy Cu Zn 42 Pb 2/Pb 3 of IS 6912 : 1985 or Brass grade LCB 2 of IS 292 : 1983

do

High conductivity copper conforming to IS 191 ( Parts 1 to 10 ) : 1980 having minimum tensile strength of 300 N/mm<sup>2</sup>

Brass tube as per IS 407 : 1981 covered with hard paper tube

Brass or copper.

Synthetic rubber having hardness IRHD 70  $\pm$  5 of IS 3400 ( Part 2 ) : 1980

Oil resistant compressed asbestos fibre jointing grade 0/1 and with permissible variation B in thickness as per IS 7212 : 1979

Oil resistant compressed asbestos fibre jointing grade of 0/1 with permissible variation in thickness B as per IS 2712 : 1979

Rubber cork, type C grade RC 70-C of IS 4253 ( Part 2 ) : 1980

PTFE or polyamide

Bright round bar as per IS 9550 : 1980, hot dip galvanized as per IS 4759 : 1979

Horn Bright round bar as per IS 9550 : 1980

Plate — Steel st. 42 W of IS 2062 : 1980

shall be in accordance with the relevant parts of shown in Fig. 14.  
IS 4218.

The dimensions and material ( where specified ) of metal parts and accessories for 52/1 000 A shall conform to those given in Fig. 1 to 14.

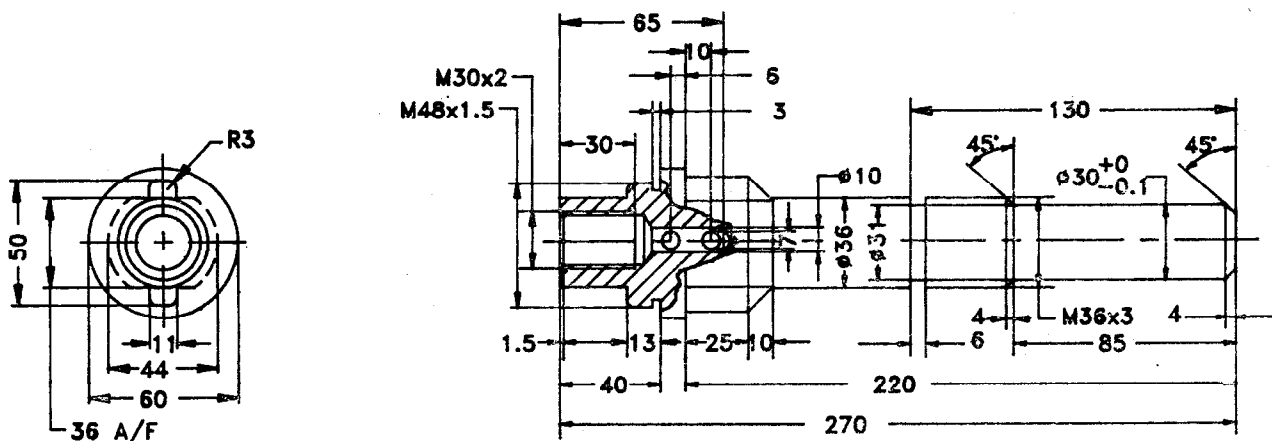
## 6 ASSEMBLY

6.1 The assembly of bushing for 52/1 000 A is

6.2 The head armature assembly for 52/1 000 A bushing is shown in Fig. 14.

## 6.3 Clamping Arrangements

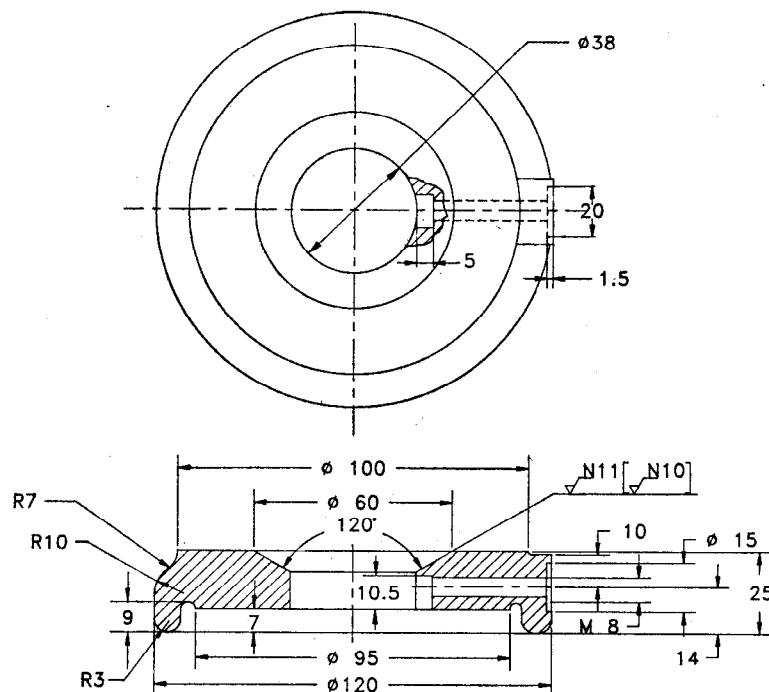
The dimensions of clamping arrangement shall be in accordance with IS 4257 ( Part 1 ) : 1981.



Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.

All dimensions in millimetres.

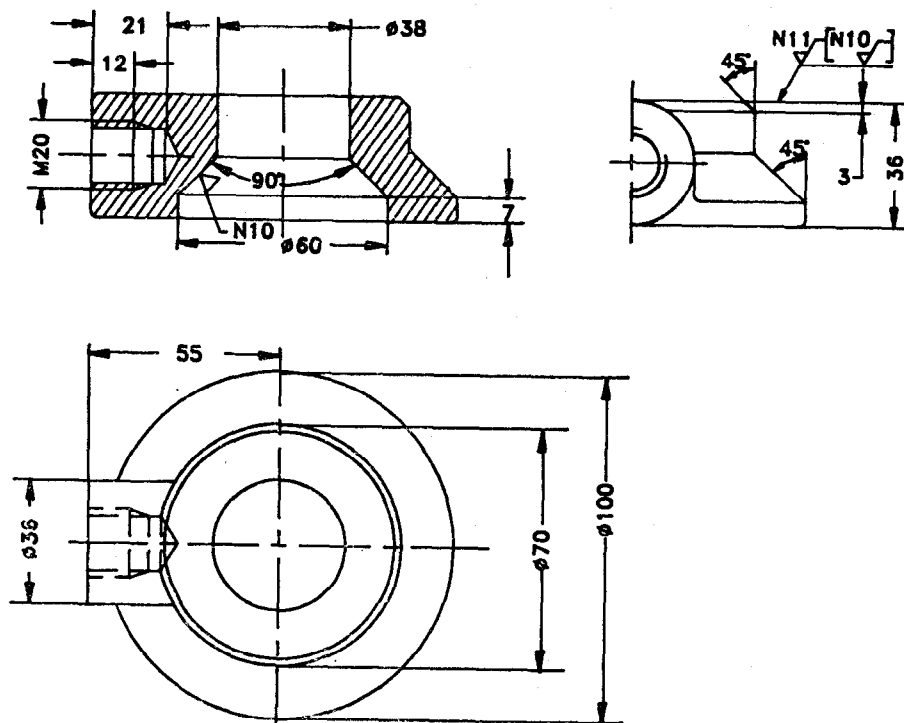
FIG. 1 STEM



Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.

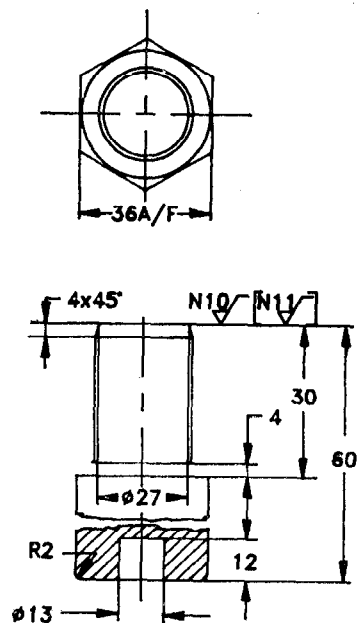
All dimensions in millimetres.

FIG. 2 CAP



Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.  
All dimensions in millimetres.

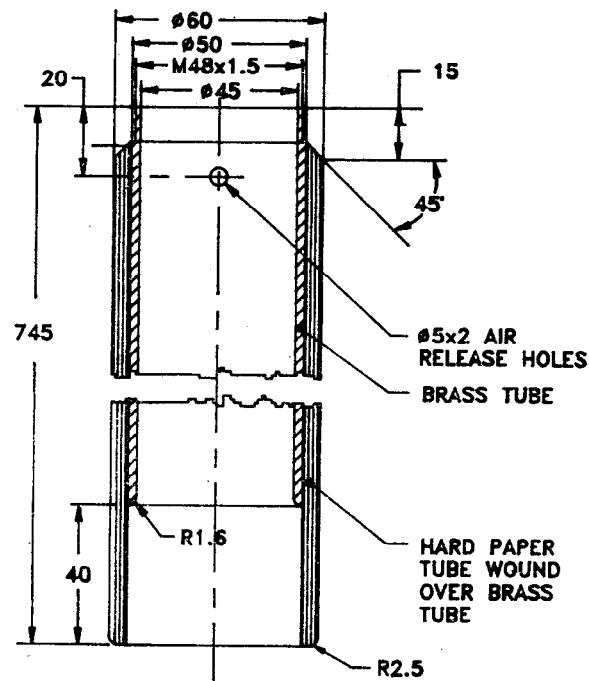
FIG. 3 SPARK GAP HORN CARRIER



Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.  
All dimensions in millimetres.

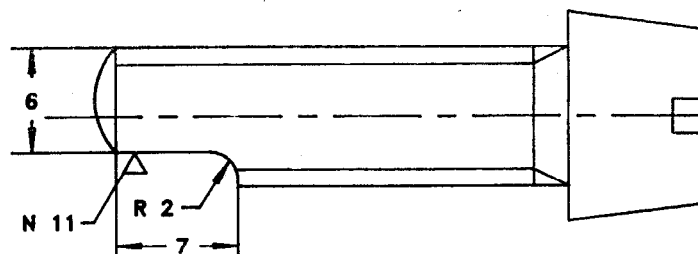
FIG. 4 TERMINAL SCREW





All dimensions in millimetres.

FIG. 5 PROTECTION TUBE

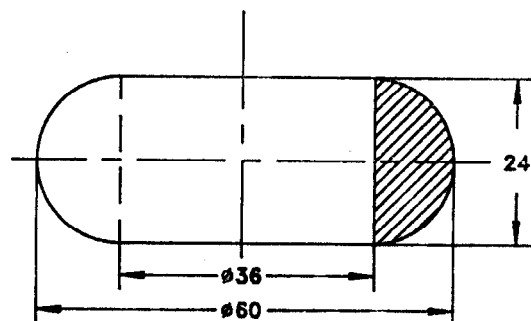


Semi-finished material : Slotted cheese head screw

AM 8 × 15 IS 1366 : 1982

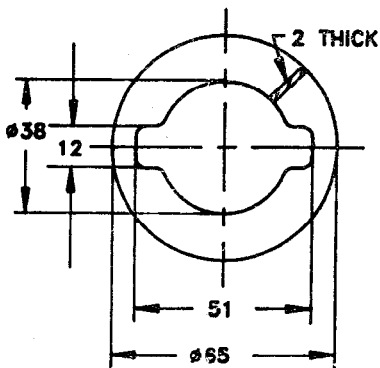
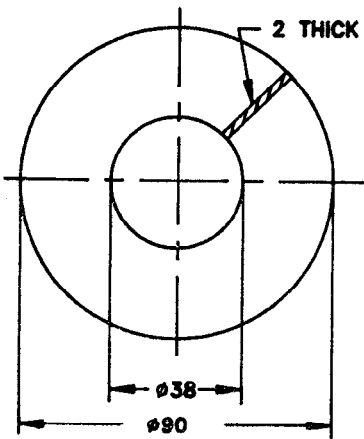
All dimensions in millimetres.

FIG. 6 VENT PLUG



All dimensions in millimetres.

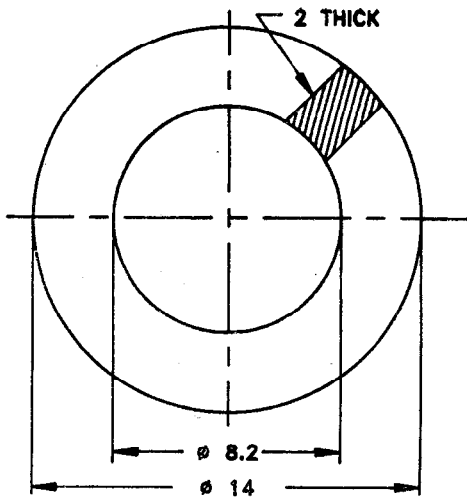
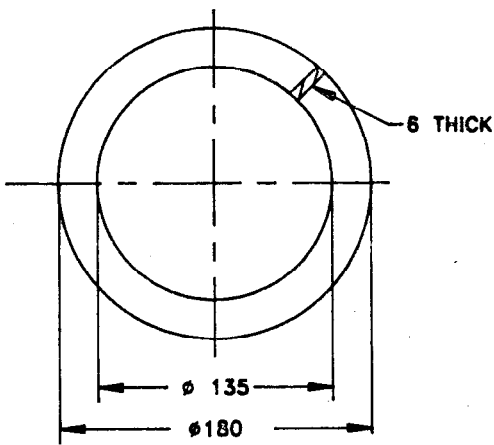
FIG. 7 SEALING WASHER FOR STEM



Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.  
All dimensions in millimetres.

FIG. 8 SEALING WASHER

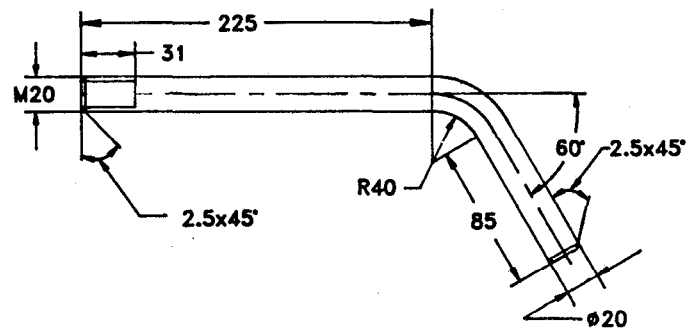
FIG. 9 SEPARATOR



Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.  
All dimensions in millimetres.

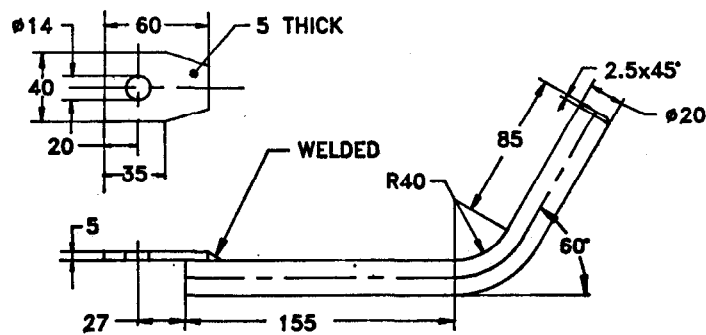
FIG. 10 SEALING WASHER — A

FIG. 11 GASKET RING



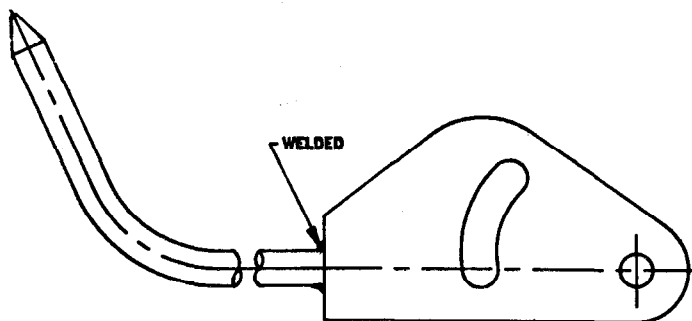
Thread ends and run out as per IS 1368 : 1980 and IS 1369 : 1982 respectively.  
Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.  
All dimensions in millimetres.

FIG. 12 UPPER SPARK-GAP HORN



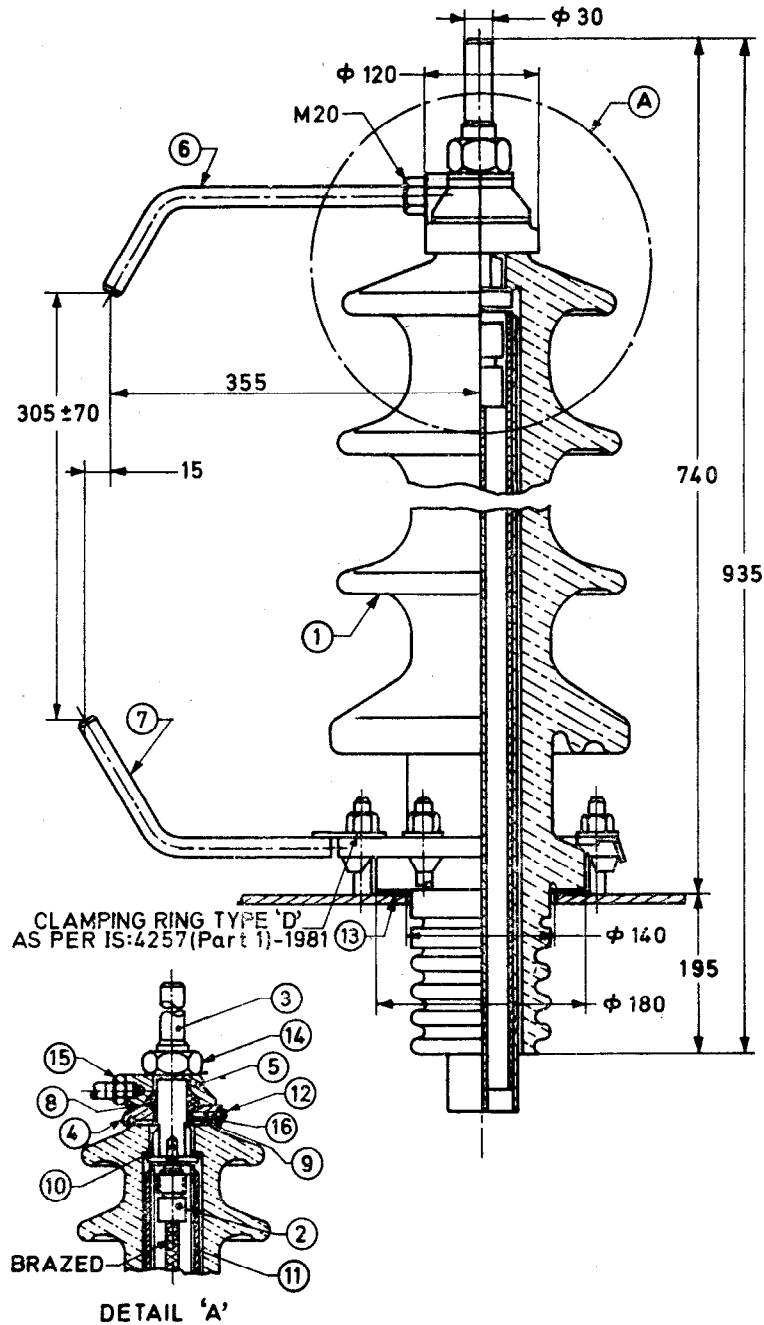
Tolerance on dimensions without specific tolerances shall be coarse class of IS 2102 ( Part 1 ) : 1980.  
All dimensions in millimetres.

13A Fixed Type



13B Adjustable Type

FIG. 13 LOWER SPARK GAP HORN



- |                            |   |
|----------------------------|---|
| 1. Insulator               | 9. Sealing Washer                                     |
| 2. Terminal Screw          | 10. Separator   |
| 3. Stem                    | 11. Protection Tube                                   |
| 4. Cap                     | 12. Vent Plug   |
| 5. Spark-Gap Horn Carrier  | 13. Sealing Washer 'A'                                |
| 6. Upper Spark — Gap Horn  | 14. Hex Nut M36×3, IS 1364 ( Part 3 ) : 1983          |
| 7. Lower Spark — Gap Horn  | 15. Hex Nut M20 Black Grade IS 1364 ( Part 3 ) : 1983 |
| 8. Sealing Washer for Stem | 16. Gasket Ring                                       |

All dimensions in millimetres.

FIG. 14 BUSHING ASSEMBLY

# ANNEX A ( Clause 2.1 )

## LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
191 ( Parts 1 to 10 ) : 1980	Specification for copper ( <i>third revision</i> ) ( covers Parts 1 to 10 )	2712 : 1979	Compressed asbestos fibre jointing ( <i>second revision</i> )
292 : 1983	Leaded brass ingots and castings ( <i>second revision</i> )	3400 ( Part 2 ) : 1980	Methods of test for vulcanized rubbers: Part 2 Hardness ( <i>first revision</i> )
407 : 1981	Brass tubes for general purposes ( <i>third revision</i> )	6912 : 1985	Copper and copper alloy forging stock and forgings ( <i>first revision</i> ) ( <i>superseding</i> IS 3488 : 1980 )
613 : 1984	Copper rods and bars for electrical purposes ( <i>second revision</i> )	4218	ISO-metric screw threads
1364 ( Part 3 ) : 1983	Specification for precision and semi-precision hexagon bolts, screws, nuts and lock nuts ( diameter range 6 to 39 mm ) ( <i>first revision</i> )	4253 ( Part 2 ) : 1980	Cork composition sheets: Part 2 Cork and rubber ( <i>first revision</i> )
2062 : 1980	Weldable structural steel ( <i>third revision</i> )	4257 ( Part 1 ) : 1981	Dimensions for clamping arrangements for porcelain transformer bushings: Part 1 For 12 to 52 kV bushings ( <i>first revision</i> )
2102 ( Part 1 ) : 1980	General tolerance for dimensions and form and position: Part 1 General tolerance for linear and angular dimensions ( <i>second revision</i> )	4759 : 1984	Hot-dip zinc coatings on structural steel and other allied products ( <i>second revision</i> )
		9550 : 1980	Specification for bright bars

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#### Amendments Issued Since Publication

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